

WHAT IS CLAIMED IS:

1. An image transmitting and receiving system comprising:

a plurality of data transmission means each for transmitting one or more
5 transmission data portions each generated as a result of compressing and encoding one
or more moving image signals taken by respective camera units; and

one or more data receiving means each for receiving said one or more
transmission data portions transmitted by said data transmission means through a
network,

10 said data transmission means each including:

a plurality of camera units each for taking a moving picture of an object;

an image inputting unit operatively connected with said camera units for
operating one or more said camera units to input one or more moving pictures taken by
said one or more camera units to be converted to one or more moving image signals;

15 an image synthesizing unit for passing through said moving image signal when
one moving image signal is converted by said image inputting unit and synthesizing
more than one moving image signal to generate a synthesized moving image signal
when more than one moving image signal is converted by said image inputting unit;

20 a compressing and encoding unit for compressing and encoding said moving
image signal passed through by said image synthesizing unit when said image
synthesizing unit passes through one moving image signal and compressing and
encoding said synthesized moving image signal generated by said image synthesizing
unit when said image synthesizing unit synthesizes more than one moving image signal
to generate coded moving image signal data;

25 one or more data transmitting units for inputting said coded moving image
signal data generated by said compressing and encoding unit, generating address
information about said one or more data receiving means to which said coded moving
image signal data is directed, and attaching address information about said one or more
data receiving means to said coded moving image signal data to generate one or more
30 transmission data portions directed to said respective one or more data receiving means;

a transmission line connection control unit for inputting said one or more
transmission data portions generated by said one or more data transmitting units,
establishing and maintaining one or more line connections between said one or more
data transmitting units and respective one or more data receiving means in accordance
35 with said address information attached in said one or more transmission data portions so
as to transmit said one or more transmission data portions through said network to said

respective one or more data receiving means, and generating line connection state information; and

a transmission control unit for controlling said image inputting unit, said image synthesizing unit, and said transmission line connection control unit in accordance with said line connection state information generated by said transmission line connection control unit;

said data receiving means each including:

a receiving line connection control unit for receiving said one or more transmission data portions transmitted by said respective one or more data transmission means;

one or more data receiving units for receiving said one or more transmission data portions to reconstruct coded moving image signal data, said receiving line connection control unit operative to establish and maintain one or more line connections between said one or more data receiving units and said respective one or more data transmission means in accordance with said address information attached in said one or more transmission data portions so as to receive said one or more transmission data portions through said network from said respective one or more data transmission means;

one or more decompressing and decoding units electrically connected with said respective one or more data receiving units in one-to-one relationship for decompressing and decoding said coded moving image signal data reconstructed by said respective one or more data receiving units to reconstruct one or more moving image signals or synthesized moving image signals;

an image synthesizing unit for passing through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing and decoding units and synthesizing more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and decoding units;

a data outputting unit for outputting said moving image signal or said synthesized moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal or said synthesized moving image signal, and outputting said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit generates said synthesized moving image signal;

a monitoring unit having a screen for displaying one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and displaying a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit;

5 an operation unit for inputting an operation instruction therethrough; and
 a receiving control unit for generating an operation request in accordance with said operation instruction inputted by said operation unit, controlling said receiving line connection control unit in accordance with said operation request and said one or more transmission data portions transmitted by said respective one or more data
10 transmission means.

2. An image transmitting and receiving system as set forth in claim 1, in which said data transmission means further includes:

 a sound collecting unit for collecting sounds to be converted into sound signals;

15 and

 a sound inputting unit for inputting said sound signals converted by said sound collecting unit;

 said compressing and encoding unit is operative to compress and encode said synthesized moving image signal synthesized by said image synthesizing unit and said
20 sound signals inputted by said sound inputting unit to generate coded moving image signal data and coded sound signal data;

 said one or more data transmitting units are operative to input said coded moving image signal data and said coded sound data generated by said compressing and encoding unit, to generate address information about said one or more data receiving
25 means to which said coded moving image signal data and said coded sound signal data are directed, and to attach said address information about said one or more data receiving means to said coded moving image signal data and said coded sound data to generate one or more transmission data portions directed to said respective one or more data receiving means,

30 said one or more data receiving units are operative to receive said one or more transmission data portions to reconstruct said coded moving image signal data and said coded sound signal data;

 said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data and said coded sound
35 signal data reconstructed by said one or more data receiving units to reconstruct one or more synthesized moving image signals and sound signals;

said image synthesizing unit is operative to pass through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to synthesize more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to pass through said sound signals decompressed and decoded by said one or more decompressing and decoding units

said data outputting unit is operative to output said moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal, and to output said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit generates said synthesized moving image signal, and to output said sound signals passed through by said image synthesizing unit; and

said monitoring unit is further provided with a speaker and operative to display one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and to display a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit, and to audibly output said sound signals outputted by said data outputting unit.

3. An image transmitting and receiving system as set forth in claim 2, in which said camera unit includes a camera portion positioned at a predetermined position and provided with a charged coupled device for taking a moving picture at a predetermined shutter speed, a driving unit for having said camera portion moved horizontally and vertically, and an image processing circuit for converting said moving picture into moving image signal.

4. An image transmitting and receiving system as set forth in claim 3, in which one of said camera units is operative to take a moving picture of a respective object at a time, said image inputting unit includes a camera switching circuit for switching one of said camera units operative to take a moving picture to another camera unit operative to take another moving picture at a predetermined interval in a predetermined order, an analog to digital converter for converting said moving picture taken by said camera unit into said moving image signal, and a memory buffer for temporally storing said moving image signal, and said transmission control unit is operative to control said image

inputting unit in accordance with said line connection state information so as to input one moving picture taken by one camera unit to be converted to one moving image signal or more than one moving picture taken by more than one camera unit to be converted to more than one moving image signal.

5

5. An image transmitting and receiving system as set forth in claim 2, in which said address information includes addresses of more than one data receiving means, and one of said one or more data transmitting units is operative to attach said address information about said more than one data receiving means to said coded moving image signal data generated by said compressing and encoding unit to generate one or more transmission data portion each directed to said more than one data receiving means, said transmission line connection control unit is operative to input said one or more transmission data portions generated by said one of said one or more data transmitting units, establishing and maintaining one or more line connections between said one of said one or more data transmitting units and respective one or more data receiving means in accordance with said address information attached in said one or more transmission data portions so as to transmit said one or more transmission data portions through said network to said respective one or more data receiving means.

10

15

20

25

30

35

6. An image transmitting and receiving system as set forth in claim 5, in which said operation unit is operative to input an operation instruction for specifying one data transmission means to establish and maintain a line connection with, and controlling said image inputting unit of said specified data transmission means to operate specified one or more camera units of said one or more camera units to input one or more moving pictures, said receiving control unit is operative to generate an operation request in accordance with said operation instruction inputted by said operation unit, said receiving line connection control unit is operative to receive said operation request generated by said receiving control unit, to identify said specified data transmission means, to establish and maintain a line connection between said specified data transmission means and one of said data receiving units in accordance with said operation request, and to transmit said operation request through said network to said specified data transmission means, said transmission line connection control unit of said specified data transmission means is operative to generate said line connection state information in accordance with said operation request transmitted by said receiving line connection control unit of said data receiving means, said transmission control unit is operative to input said line connection state information generated by said transmission

line connection control unit, and to control said transmission line connection control unit in accordance with said line connection state information so as to maintain a line connection between said data receiving means and said data transmission means, said transmission control unit is further operative to control said image inputting unit in accordance with said line connection state information so that said image inputting unit operate said specified one or more camera units of said one or more camera units to input one or more moving pictures to be converted to one or more moving image signals, and said transmission control unit is further operative to control said image synthesizing unit in accordance with said line connection state information so that said image synthesizing unit passes through said moving image signal when one moving image signal is converted by said image inputting unit and synthesizes more than one moving image signal to generate a synthesized moving image signal when more than one moving image signal is converted by said image inputting unit.

7. An image transmitting and receiving system as set forth in claim 6, in which said operation unit is operative to input an operation instruction for specifying one data transmission means to establish and maintain a line connection with, and specifying positions of specified one or more camera units of said one or more camera units operatively connected with said image inputting unit of specified data transmission means, said receiving control unit is operative to generate an operation request in accordance with said operation instruction inputted by said operation unit, said receiving line connection control unit is operative to receive said operation request generated by said receiving control unit, to identify said specified data transmission means, to establish and maintain a line connection between said specified data transmission means and one of said data receiving units in accordance with said operation request, and to transmit said operation request through said network to said specified data transmission means, and said transmission control unit is operative to control said image inputting unit in accordance with said line connection state information so that said image inputting unit operates said specified one or more camera units of said one or more camera units to drive one or more driving units of said specified one or more camera units of said one or more camera units to have said camera portions of said specified one or more camera units of said one or more camera units moved horizontally and vertically to said respective specified positions.

8. An image transmitting and receiving system as set forth in claim 6, in which said operation unit is operative to input a switching operation instruction for switching

said data transmission means to another data transmission means while said data transmission means maintains a line connection between said data transmission means and one of said data receiving units of said data receiving means, said receiving control unit is operative to generate a switching operation request in accordance with said switching operation instruction inputted by said operation unit, said receiving line connection control unit is operative to receive said switching operation request generated by said receiving control unit, to disconnect a line connection between said data transmission means and the respective one of the data receiving units if required, to identify said another data transmission means, to establish and maintain another line connection between said another data transmission means and another one of said data receiving units in accordance with said switching operation request, and to transmit said operation request through said network to said another data transmission means, said transmission line connection control unit of said another data transmission means is operative to generate said line connection state information in accordance with said switching operation request transmitted by said receiving line connection control unit of said data receiving means, and said transmission control unit is operative to input said line connection state information generated by said transmission line connection control unit, and to control said transmission line connection control unit in accordance with said line connection state information so as to maintain a line connection between said data receiving means and said data transmission means.

9. An image transmitting and receiving system as set forth in claim 8, in which said data receiving means further includes a configuration control unit having a configuration storage portion for inputting configuration conditions to be stored therein, said configuration conditions include a time interval for which one data transmission means is switched to another data transmission means, and a switching order in which said data transmission means is switched, and said receiving control unit is operative to generate a regular switching operation request at said time interval in said switching order in accordance with said configuration conditions stored in said configuration control unit.

10. An image transmitting and receiving system as set forth in claim 1, in which said data receiving means further includes a configuration control unit having a configuration storage portion for inputting configuration conditions to be stored therein, said configuration conditions include information about one-to-one relationship between said one or more data receiving units and said one or more data transmission

means, said receiving control unit is operative to generate a receiving operation request in accordance with said configuration conditions stored in said configuration control unit, said receiving line connection control unit is operative to receive said receiving operation request generated by said receiving control unit, to identify said specified one or more data transmission means, to establish and maintain line connections between said specified data transmission means and said one or more data receiving units each corresponding to respective one or more data transmission means in one-to-one relationship in accordance with said receiving operation request, and to transmit said operation request through said network to said specified data transmission means, said transmission line connection control unit of said specified data transmission means is operative to generate said line connection state information in accordance with said receiving operation request transmitted by said receiving line connection control unit of said data receiving means, and said transmission control unit is operative to input said line connection state information generated by said transmission line connection control unit, and to control said transmission line connection control unit in accordance with said line connection state information so as to maintain line connections between said data receiving means and said respective one or more data receiving units.

11. An image transmitting and receiving system as set forth in claim 10, in which said one or more data receiving means are operative to receive said one or more transmission data portions at respective input bit rates, said configuration conditions include information about said input bit rate, said receiving control unit of said data receiving means is operative to generate a receiving operation request in accordance with said configuration conditions stored in said configuration control unit, said receiving line connection control unit is operative to receive said receiving operation request generated by said receiving control unit, to establish and maintain line connections between said specified data transmission means and said data receiving means, and to transmit said receiving operation request through said network to said specified data transmission means, said transmission line connection control unit is operative to generate said line connection state information in accordance with said operation request transmitted by the receiving line connection control unit, and said respective one of said one or more data transmitting units is operative to generate one or more transmission data portions directed to said data receiving means at said input bit rate.

12. An image transmitting and receiving system as set forth in claim 1, in which

10031-492550

said data receiving means is operative to receive one or more transmission data portions transmitted by another data transmission means, and said receiving line connection control unit of said data receiving means is operative to establish and maintain another line connection between another one of said data receiving units and said another data transmission means in response to said one or more transmission data portions transmitted by another data transmission means, while said data receiving means maintains a line connection between said data receiving means and one data transmission means, and said receiving line connection control unit maintains a line connection between one of said data receiving units and said data transmission means.

10 13. An image transmitting and receiving system as set forth in claim 1, in which while said data transmission means maintains a line connection between said data receiving means and said data transmission means, and said transmission line connection control unit maintains a line connection between one of said data transmitting units and said data receiving means so as to transmit said one or more transmission data portions generated by said one of said data transmitting units to said data receiving means, said data transmission means is operative to transmit one or more transmission data portions to another data receiving means, said transmission line connection control unit of said data transmission means is operative to establish and maintain another line connection between said another data receiving means and another one of said data transmitting units so as to transmit said one or more transmission data portions to said another data receiving means, and said receiving line connection control unit of said another data receiving means is operative to establish and maintain said line connection between one of said data receiving units and said data transmission means to receive said one or more transmission data portions transmitted by said data transmission means.

30 14. An image transmitting and receiving system as set forth in claim 1, in which when a line connection between data transmission means and data receiving means is disconnected while one of said data transmitting units is transmitting one or more transmission data portions through said network to said data receiving means, said transmission line connection control unit is operative to restore and maintain said line connection between one of said data transmitting units and said data receiving means so as to transmit said one or more transmission data portions generated by said one of said data transmitting units through said network to said data receiving means, said receiving line connection control unit is operative to restore and maintain said line connection

between one of said data receiving units and said data transmission means to receive said one or more transmission data portions transmitted by said data transmission means.

5 15. An image transmitting and receiving system as set forth in claim 1, in which
said compressing and encoding unit is operative to compress and encode said moving
image signal passed through by said image synthesizing unit when one moving image
signal is converted by said image inputting unit and said synthesized moving image
signal generated by said image synthesizing unit when more than one moving image
10 signal is converted by said image inputting unit in conformance with the ITU-T
Recommendation H.261 standard or ITU-T Recommendation H.263 standard to
generate coded moving image signal data, and said one or more decompressing and
decoding units are operative to decompress and decode said coded moving image signal
data reconstructed by said one or more data receiving units in conformance with the
15 ITU-T Recommendation H.261 standard or ITU-T Recommendation H.263 standard to
reconstruct one or more moving image signals.

16. An image transmitting and receiving system as set forth in claim 1, in which
said compressing and encoding unit is operative to compress and encode said moving
20 image signal passed through by said image synthesizing unit when one moving image
signal is converted by said image inputting unit and said synthesized moving image
signal generated by said image synthesizing unit when more than one moving image
signal is converted by said image inputting unit in conformance with the MPEG-1,
MPEG-2 or MPEG-3 standard to generate coded moving image signal data, and said
25 one or more decompressing and decoding units are operative to decompress and decode
said coded moving image signal data reconstructed by said one or more data receiving
units in conformance with the MPEG-1, MPEG-2, or MPEG-3 standard to reconstruct
one or more moving image signals.

30 17. An image transmitting and receiving system as set forth in claim 1, in which
said compressing and encoding unit is operative to compress and encode said moving
image signal passed through by said image synthesizing unit when one moving image
signal is converted by said image inputting unit and said synthesized moving image
signal generated by said image synthesizing unit when more than one moving image
35 signal is converted by said image inputting unit in conformance with the JPEG or
JPEG2000 standard to generate coded moving image signal data, and said one or more

decompressing and decoding units is operative to decompress and decode said coded moving image signal data reconstructed by said one or more data receiving units in conformance with the JPEG or JPEG2000 standard to reconstruct one or more moving image signals.

5

18. An image transmitting and receiving system as set forth in claim 2, in which said data transmission means further includes a recording unit for temporally storing said coded moving image signal data and coded sound signal data generated by said compressing and encoding unit together with time information indicative of the time at which said coded moving image signal data arrives at said recording unit, event information indicative of the event type of said coded moving image signal data, and number information indicative of the number of said coded moving image signal data so that said coded moving image signal data and coded sound signal data are associated with said time information, said event information and said number information, said transmission control unit is operative to control said recording unit in accordance with said line connection state information generated by said transmission line connection control unit with reference to said time information, said event information, and said number information.

19. An image transmitting and receiving system as set forth in claim 2, in which said data receiving means further includes a recording unit for temporally inputting said coded moving image signal data and said coded sound signal data reconstructed by said one or more data receiving units, and storing said coded moving image signal data and said coded sound signal data in association with time information including a time at which said coded moving image signal data arrives at said recording unit, event information including an event type of said coded moving image signal data, and number information including a number of said coded moving image signal data in accordance with said operation instruction inputted by said operation unit.

20. An image transmitting and receiving system as set forth in claim 19, in which said operation unit is operative to input a synthesizing operation instruction for synthesizing specified moving image signals or synthesized moving image signals for said image synthesizing unit, said receiving control unit is operative to generate a synthesizing operation request in accordance with said synthesizing operation instruction inputted by said operation unit, and said image synthesizing unit is operative to select specified moving image signals or synthesized moving image signals from

among said moving image signals or synthesized moving image signals reconstructed by said one or more decompressing and decoding units in accordance with said synthesizing operation request generated by said receiving control unit and synthesizing said specified moving image signal or synthesized moving image signal to generate a synthesized moving image signal when said moving image signals or synthesized moving image signals are reconstructed by said one or more decompressing and decoding units.

21. An image transmitting and receiving system as set forth in claim 20, in which said operation unit is operative to input a reproducing operation instruction for controlling said recording unit to output said coded moving image signal data and said coded sound signal data stored therein, said receiving control unit is operative to generate a reproducing operation request in accordance with said reproducing operation instruction inputted by said operation unit, said recording unit is operative to output said coded moving image signal data and coded sound signal data stored therein in accordance with said reproducing operation request generated by said receiving control unit, and said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data and said coded sound signal data outputted by said recording unit to reconstruct one or more synthesized moving image signals and sound signals.

22. An image transmitting and receiving system as set forth in claim 21, in which said operation unit is operative to input a searching operation instruction for searching a target coded moving image signal data and coded sound signal data with a key information containing at least one of said time information, said event information and said number information, said receiving control unit is operative to generate a searching operation request in accordance with said searching operation instruction inputted by said operation unit, and said recording unit is operative to search said target coded moving image signal data and coded sound signal data from among said coded moving image signal data and coded sound signal data stored in said recording unit in accordance with said searching operation request including said key information by comparing said time information, said event information, and said number information associated with said coded moving image signal data and coded sound signal data with said key information to identify said target coded moving image signal data and coded sound signal data associated with at least one of said time information, said event information and said number information identical with said at least one of said time

information, and to output said target coded moving image signal data and coded sound signal data.

23. An image transmitting and receiving system as set forth in claim 22, in which
5 said data transmission means further includes an external appliance unit for outputting a status control signal indicative of the state of said external appliance unit, and an appliance control data communication unit for transmitting said status control signal
10 outputted by said external appliance unit to said transmission line connection control unit of said data receiving means through said network while said line connection between said data transmission means and said data receiving means is established and maintained, and said external appliance control data communication unit is operative to
15 generate and transmit appliance control signal to the external appliance unit in accordance with a line connection state information generated by said transmission line connection control unit, and said external appliance unit is operative to operate in accordance with said respective appliance control signal generated by said appliance control data communication unit.

24. An image transmitting and receiving system as set forth in claim 23, in which
20 said data transmission means includes a plurality of external appliance units for respectively outputting a plurality of status control signals each indicative of the state of said external appliance unit, said appliance control data communication unit is operative to transmit said status control signals respectively outputted by said external appliance units to said transmission line connection control unit, and to receive said line connection state information generated by said transmission line connection control unit
25 to generate a plurality of appliance control signals, and said external appliance units being operative to respectively operate in accordance with said appliance control signals generated by said appliance control data communication unit.

25. An image transmitting and receiving system as set forth in claim 24, in which
30 said data receiving means further includes an external appliance control unit for inputting an external appliance operation instruction for operating specified one or more external appliance units of said data transmission means to generate an external appliance operation request, said receiving line connection control unit is operative to transmit said external appliance operation request generated by said external appliance
35 control unit through said network to said data transmission means when said receiving line connection control unit maintains said line connection between said data receiving

means and said data transmission means, said transmission line connection control unit of said data transmission means is operative to receive said external appliance operation request, and to generate a line connection state information in accordance with said external appliance operation request thus received, and said appliance control data communication unit is operative to receive said line connection state information generated by said transmission line connection control unit to generate one or more appliance control signals, said specified one or more external appliance units are operative to respectively operate in accordance with said one or more appliance control signals generated by said appliance control data communication unit.

26. An image transmitting and receiving system as set forth in claim 25, in which said external appliance control unit is operative to input an appliance status indicating instruction for displaying the status of specified one or more external appliance units, said one or more external appliance units are operative to respectively output one or more status control signals each indicative of the state of said external appliance unit including the type of said external appliance, said appliance control data communication unit is operative to transmit said one or more status control signals respectively outputted by said one or more external appliance units to said transmission line connection control unit, said transmission line connection control unit is operative to transmit said one or more status control signals through said network to said data receiving means when said transmission line connection control unit maintains said line connection between data transmission means and said data receiving means, said receiving line connection control unit of said data receiving means is operative to receive said one or more status control signals, and said external appliance control unit is operative to input said one or more status control signals received by said receiving line connection control unit, and to indicate the status of said specified one or more external appliance units in accordance with said appliance status indicating instruction for displaying the status of specified one or more external appliance units.

27. An image transmitting and receiving system as set forth in claim 26, in which said external appliance control unit is operated to input an appliance status displaying instruction for displaying the status of specified one or more external appliance units and output said appliance status displaying instruction to said monitoring unit, and said monitoring unit is operative to input said one or more status control signals respectively indicative of the status of said one or more external appliance units received by said receiving line connection control unit, and to display the status of said specified one or

more external appliance units from among said one or more external appliance units in accordance with said appliance status displaying instruction outputted by said external appliance control unit when said receiving line connection control unit maintains said line connection between said data receiving means and said data transmission means.

5

28. An image transmitting and receiving system as set forth in claim 27, in which said external appliance control unit is operative to input an external appliance operation instruction for operating specified one or more external appliance units when said monitoring unit displays the status of said specified one or more external appliance units while said receiving line connection control unit maintains said line connection between said data receiving means and said data transmission means.

10

29. An image transmitting and receiving system as set forth in claim 28, in which said monitoring unit is operative to display said one or more moving pictures and the status of said specified one or more external appliance units on said screen at the same time.

15

30. An image transmitting and receiving system as set forth in claim 29, in which said external appliance control unit is operative to input an external appliance operation instruction for operating specified one or more external appliance units when said monitoring unit displays said one or more moving pictures and the status of said specified one or more external appliance units while said receiving line connection control unit maintains said line connection between said data receiving means and said data transmission means.

20

25

31. An image transmitting and receiving system as set forth in claim 29, in which said image inputting unit of said data transmission means is operative to generate camera status information indicative of the status of said camera unit, said operation unit is operative to input a camera status display instruction for displaying the status of specified camera unit of specified data transmission means, said receiving control unit is operative to generate a camera status display operation request in accordance with said camera status display instruction inputted by said operation unit, said receiving line connection control unit is operative to transmit said camera status display operation request generated by said receiving control unit to said specified data transmission means while said receiving line connection control unit maintains said line connection between said data receiving means and said specified data transmission means, said

30

35

transmission line connection unit is operative to receive said camera status display operation request to be outputted to said image inputting unit of said specified camera unit, said image inputting unit is operative to generate said camera status information indicative of the status of said specified camera unit from said camera units in accordance with said camera status display operation request outputted by said transmission line connection unit, and said transmission line connection unit is operative to transmit said camera status information to said receiving line connection control unit, and said monitoring unit is operative to display said status of said specified camera unit of said specified data transmission means in accordance with said camera status information.

32. An image transmitting and receiving system as set forth in claim 31, in which said camera unit further includes a rotatable plate on which said camera portion is mounted, said rotatable plate is electrically connected with said image inputting unit, said transmission control unit is operative to control said image inputting unit so as to rotate said camera portion to any one of a plurality of camera angles of camera units in association with respective camera unit position numbers, said image inputting unit includes a storage portion for storing said camera angles of a specified camera unit and camera unit position numbers, the status of said camera unit includes all of camera angles of camera units and said camera unit position numbers, whereby said operation unit is operative to input a camera unit position number of a specified data transmission means and a camera angle number storing instruction for storing said camera angle of said specified camera unit so as to store the present camera angle of said specified camera unit of said specified data transmission means in association with said camera unit position number thus inputted, said receiving control unit is operative to generate a camera angle number storing operation request in accordance with said camera angle number storing instruction inputted by said operation unit, said receiving line connection control unit is operative to transmit said camera angle number storing operation request generated by said receiving control unit to said specified data transmission means while said receiving line connection control unit maintains said line connection between said data receiving means and said specified data transmission means, said transmission line connection unit is operative to receive said camera angle number storing operation request to be outputted to said image inputting unit of said specified camera unit, and said image inputting unit is operative to store the present camera angle of said specified data transmission means in association with said camera unit position number thus inputted in accordance with said camera angle number storing

operation request outputted by said transmission line connection unit.

33. An image transmitting and receiving system as set forth in claim 32, in which said operation unit is operative to input a camera unit position number of a specified data transmission means and a camera angle number operation instruction for moving said camera angle of said specified data transmission means to said camera angle in association with said camera unit position number thus inputted, said receiving control unit is operative to generate a camera angle number operation request in accordance with said camera angle number operation instruction inputted by said operation unit, and said transmission control unit is operative to control said image inputting unit so as to rotate said camera portion of said specified camera unit to said camera angle in association with said camera unit position number inputted by said operation unit.

34. An image transmission apparatus for transmitting one or more transmission data portions each generated as a result of compressing and encoding one or more moving image signals taken by respective camera units comprising:

a plurality of camera units each for taking a moving picture of an object;

an image inputting unit operatively connected with said camera units for operating one or more said camera units to input one or more moving pictures taken by said one or more camera units to be converted to one or more moving image signals;

an image synthesizing unit for passing through said moving image signal when one moving image signal is converted by said image inputting unit and synthesizing more than one moving image signal to generate a synthesized moving image signal when more than one moving image signal is converted by said image inputting unit;

a compressing and encoding unit for compressing and encoding said moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through one moving image signal and compressing and encoding said synthesized moving image signal generated by said image synthesizing unit when said image synthesizing unit synthesizes more than one moving image signal to generate coded moving image signal data;

one or more data transmitting units for inputting said coded moving image signal data generated by said compressing and encoding unit, generating address information about one or more image receiving apparatus to which said coded moving image signal data is directed, and attaching address information about said one or more image receiving apparatus to said coded moving image signal data to generate one or more transmission data portions directed to said respective one or more image receiving

apparatus;

a transmission line connection control unit for inputting said one or more transmission data portions generated by said one or more data transmitting units, establishing and maintaining one or more line connections between said one or more data transmitting units and respective one or more image receiving apparatus in accordance with said address information attached in said one or more transmission data portions so as to transmit said one or more transmission data portions through said network to said respective one or more image receiving apparatus, and generating line connection state information; and

a transmission control unit for controlling said image inputting unit, said image synthesizing unit, and said transmission line connection control unit in accordance with said line connection state information generated by said transmission line connection control unit.

35. An image receiving apparatus for receiving said one or more transmission data portions transmitted by one or more image transmission apparatus through a network comprising:

a receiving line connection control unit for receiving said one or more transmission data portions transmitted by said respective one or more image transmission apparatus;

one or more data receiving units for receiving said one or more transmission data portions to reconstruct coded moving image signal data, said receiving line connection control unit operative to establish and maintain one or more line connections between said one or more data receiving units and said respective one or more image transmission apparatus in accordance with said address information attached in said one or more transmission data portions so as to receive said one or more transmission data portions through said network from said respective one or more image transmission apparatus;

one or more decompressing and decoding units electrically connected with said respective one or more data receiving units in one-to-one relationship for decompressing and decoding said coded moving image signal data reconstructed by said respective one or more data receiving units to reconstruct one or more moving image signals or synthesized moving image signals.

an image synthesizing unit for passing through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing

and decoding units and synthesizing more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and decoding units;

5 a data outputting unit for outputting said moving image signal or said synthesized moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal or said synthesized moving image signal, and outputting said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit
10 generates said synthesized moving image signal;

a monitoring unit having a screen for displaying one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and displaying a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit;

15 an operation unit for inputting an operation instruction therethrough; and

a receiving control unit for generating an operation request in accordance with said operation instruction inputted by said operation unit, controlling said receiving line connection control unit in accordance with said operation request and said one or more transmission data portions transmitted by said respective one or more image
20 transmission apparatus.

36. An image transmission apparatus as set forth in claim 34 further including:

a sound collecting unit for collecting sounds to be converted into sound signals;

and

25 a sound inputting unit for inputting said sound signals converted by said sound collecting unit;

said compressing and encoding unit is operative to compress and encode said synthesized moving image signal synthesized by said image synthesizing unit and said sound signals inputted by said sound inputting unit to generate coded moving image
30 signal data and coded sound signal data;

said one or more data transmitting units are operative to input said coded moving image signal data and said coded sound data generated by said compressing and encoding unit, to generate address information about said one or more image receiving apparatus to which said coded moving image signal data and said coded sound signal
35 data are directed, and to attach said address information about said one or more image receiving apparatus to said coded moving image signal data and said coded sound data

to generate one or more transmission data portions directed to said respective one or more image receiving apparatus.

37. An image receiving apparatus as set forth in claim 35 in which

5 said one or more data receiving units are operative to receive said one or more transmission data portions to reconstruct said coded moving image signal data and said coded sound signal data;

10 said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data and said coded sound signal data reconstructed by said one or more data receiving units to reconstruct one or more synthesized moving image signals and sound signals;

15 said image synthesizing unit is operative to pass through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to synthesize more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to pass through said sound signals decompressed and decoded by said one or more decompressing and decoding units

20 said data outputting unit is operative to output said moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal, and to output said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit generates said synthesized moving image signal, and to output said sound signals passed through by said image synthesizing unit; and

25 said monitoring unit is further provided with a speaker and operative to display one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and to display a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit, and to audibly output said sound signals outputted by said data outputting unit.

38. An image transmission apparatus as set forth in claim 34, in which said respective one of said one or more data transmitting units is operative to generate one or more transmission data portions directed to image receiving apparatus at an input bit rate at which image receiving apparatus can receive said one or more data portions.

39. Image transmission apparatus as set forth in claim 34 further including a recording unit for temporally storing said coded moving image signal data and coded sound signal data generated by said compressing and encoding unit together with time information indicative of the time at which said coded moving image signal data arrives at said recording unit, event information indicative of the event type of said coded moving image signal data, and number information indicative of the number of said coded moving image signal data so that said coded moving image signal data and coded sound signal data are associated with said time information, said event information and said number information, said transmission control unit is operative to control said recording unit in accordance with said line connection state information generated by said transmission line connection control unit with reference to said time information, said event information, and said number information.

40. An image receiving apparatus as set forth in claim 35 further including a recording unit for temporally inputting said coded moving image signal data and said coded sound signal data reconstructed by said one or more data receiving units, and storing said coded moving image signal data and said coded sound signal data in association with time information including a time at which said coded moving image signal data arrives at said recording unit, event information including an event type of said coded moving image signal data, and number information including a number of said coded moving image signal data in accordance with said operation instruction inputted by said operation unit.

41. An image receiving apparatus as set forth in claim 40, in which said recording unit is operative to search said target coded moving image signal data and coded sound signal data from among said coded moving image signal data and coded sound signal data stored in said recording unit in accordance with said searching operation request including said key information by comparing said time information, said event information, and said number information associated with said coded moving image signal data and coded sound signal data with said key information to identify said target coded moving image signal data and coded sound signal data associated with at least one of said time information, said event information and said number information identical with said at least one of said time information, and to output said target coded moving image signal data and coded sound signal data.

42. An image transmitting and receiving method comprising the steps of:
a preparing step of preparing:

a plurality of data transmission means each for transmitting one or more transmission data portions each generated as a result of compressing and encoding one or more moving image signals taken by respective camera units; and

one or more data receiving means each for receiving said one or more transmission data portions transmitted by said data transmission means through a network,

said data transmission means each including:

a plurality of camera units each for taking a moving picture of an object;

an image inputting unit operatively connected with said camera units for operating one or more said camera units to input one or more moving pictures taken by said one or more camera units to be converted to one or more moving image signals;

an image synthesizing unit for passing through said moving image signal when one moving image signal is converted by said image inputting unit and synthesizing more than one moving image signal to generate a synthesized moving image signal when more than one moving image signal is converted by said image inputting unit;

a compressing and encoding unit for compressing and encoding said moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through one moving image signal and compressing and encoding said synthesized moving image signal generated by said image synthesizing unit when said image synthesizing unit synthesizes more than one moving image signal to generate coded moving image signal data;

one or more data transmitting units for inputting said coded moving image signal data generated by said compressing and encoding unit, generating address information about said one or more data receiving means to which said coded moving image signal data is directed, and attaching address information about said one or more data receiving means to said coded moving image signal data to generate one or more transmission data portions directed to said respective one or more data receiving means;

a transmission line connection control unit for inputting said one or more

transmission data portions generated by said one or more data transmitting units, establishing and maintaining one or more line connections between said one or more data transmitting units and respective one or more data receiving means in accordance with said address information attached in said one or more transmission data portions so as to transmit said one or more transmission data portions through said network to said respective one or more data receiving means, and generating line connection state information; and

a transmission control unit for controlling said image inputting unit, said image synthesizing unit, and said transmission line connection control unit in accordance with said line connection state information generated by said transmission line connection control unit;

said data receiving means each including:

a receiving line connection control unit for receiving said one or more transmission data portions transmitted by said respective one or more data transmission means;

one or more data receiving units for receiving said one or more transmission data portions to reconstruct coded moving image signal data, said receiving line connection control unit operative to establish and maintain one or more line connections between said one or more data receiving units and said respective one or more data transmission means in accordance with said address information attached in said one or more transmission data portions so as to receive said one or more transmission data portions through said network from said respective one or more data transmission means;

one or more decompressing and decoding units electrically connected with said respective one or more data receiving units in one-to-one relationship for decompressing and decoding said coded moving image signal data reconstructed by said respective one or more data receiving units to reconstruct one or more moving image signals or synthesized moving image signals;

an image synthesizing unit for passing through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing and decoding units and synthesizing more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and

decoding units;

a data outputting unit for outputting said moving image signal or said synthesized moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal or said synthesized moving image signal, and outputting said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit generates said synthesized moving image signal;

a monitoring unit having a screen for displaying one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and displaying a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit;

an operation unit for inputting an operation instruction therethrough; and

a receiving control unit for generating an operation request in accordance with said operation instruction inputted by said operation unit, and controlling said receiving line connection control unit in accordance with said operation request and said one or more transmission data portions transmitted by said respective one or more data transmission means.

a receiving control step of having said receiving control unit generate an operation request in accordance with said operation instruction inputted by said operation unit, and control said receiving line connection control unit in accordance with said operation request and said one or more transmission data portions transmitted by said respective one or more data transmission means.

43. An image transmitting and receiving method as set forth in claim 42, in which said preparing step is of further preparing: a sound collecting unit for collecting sounds to be converted into sound signals; and a sound inputting unit for inputting said sound signals converted by said sound collecting unit, for said data transmission means;

said compressing and encoding unit is operative to compress and encode said synthesized moving image signal synthesized by said image synthesizing unit and said sound signals inputted by said sound inputting unit to generate coded moving image signal data and coded sound signal data;

said one or more data transmitting units are operative to input said coded moving image signal data and said coded sound data generated by said compressing and encoding unit, to generate address information about said one or more data receiving means to which said coded moving image signal data and said coded sound signal data

are directed, and to attach said address information about said one or more data receiving means to said coded moving image signal data and said coded sound data to generate one or more transmission data portions directed to said respective one or more data receiving means,

5 said one or more data receiving units are operative to receive said one or more transmission data portions to reconstruct said coded moving image signal data and said coded sound signal data;

10 said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data and said coded sound signal data reconstructed by said one or more data receiving units to reconstruct one or more synthesized moving image signals and sound signals;

15 said image synthesizing unit is operative to pass through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to synthesize more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to pass through said sound signals decompressed and decoded by said one or more decompressing and decoding units,

20 said data outputting unit is operative to output said moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal, and to output said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit generates said synthesized moving image signal, and to output said sound signals passed through by said image synthesizing unit; and

25 said monitoring unit is further provided with a speaker and operative to display one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and to display a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit, and to audibly output said sound signals outputted by said data outputting unit, and which further comprises a sound inputting step of having sound inputting unit input said sound signals converted by said sound collecting unit, for said data transmission means;

30 44. An image transmitting and receiving method as set forth in claim 43, in which

said camera unit includes a camera portion positioned at a predetermined position and provided with a charged coupled device for taking a moving picture at a predetermined shutter speed, a driving unit for having said camera portion moved horizontally and vertically, and an image processing circuit for converting said moving picture into moving image signal.

45. An image transmitting and receiving method as set forth in claim 44, in which one of said camera units is operative to take a moving picture of a respective object at a time, said image inputting unit includes a camera switching circuit for switching one of said camera units operative to take a moving picture to another camera unit operative to take another moving picture at a predetermined interval in a predetermined order, an analog to digital converter for converting said moving picture taken by said camera unit into said moving image signal, and a memory buffer for temporally storing said moving image signal, and said transmission control unit is operative to control said image inputting unit in accordance with said line connection state information so as to input one moving picture taken by one camera unit to be converted to one moving image signal or more than one moving picture taken by more than one camera unit to be converted to more than one moving image signal.

46. An image transmitting and receiving method as set forth in claim 43, in which said address information includes addresses of more than one data receiving means, and one of said one or more data transmitting units is operative to attach said address information about said more than one data receiving means to said coded moving image signal data generated by said compressing and encoding unit to generate one or more transmission data portion each directed to said more than one data receiving means, said transmission line connection control unit is operative to input said one or more transmission data portions generated by said one of said one or more data transmitting units, establishing and maintaining one or more line connections between said one of said one or more data transmitting units and respective one or more data receiving means in accordance with said address information attached in said one or more transmission data portions so as to transmit said one or more transmission data portions through said network to said respective one or more data receiving means.

47. An image transmitting and receiving method as set forth in claim 46, in which said operation unit is operative to input an operation instruction for specifying one data transmission means to establish and maintain a line connection with, and controlling

5 said image inputting unit of said specified data transmission means to operate specified one or more camera units of said one or more camera units to input one or more moving pictures, said receiving control unit is operative to generate an operation request in accordance with said operation instruction inputted by said operation unit, said receiving line connection control unit is operative to receive said operation request generated by said receiving control unit, to identify said specified data transmission means, to establish and maintain a line connection between said specified data transmission means and one of said data receiving units in accordance with said operation request, and to transmit said operation request through said network to said specified data transmission means, said transmission line connection control unit of said specified data transmission means is operative to generate said line connection state information in accordance with said operation request transmitted by said receiving line connection control unit of said data receiving means, said transmission control unit is operative to input said line connection state information generated by said transmission line connection control unit, and to control said transmission line connection control unit in accordance with said line connection state information so as to maintain a line connection between said data receiving means and said data transmission means, said transmission control unit is further operative to control said image inputting unit in accordance with said line connection state information so that said image inputting unit operate said specified one or more camera units of said one or more camera units to input one or more moving pictures to be converted to one or more moving image signals, and said transmission control unit is further operative to control said image synthesizing unit in accordance with said line connection state information so that said image synthesizing unit passes through said moving image signal when one moving image signal is converted by said image inputting unit and synthesizes more than one moving image signal to generate a synthesized moving image signal when more than one moving image signal is converted by said image inputting unit.

48. An image transmitting and receiving method as set forth in claim 47, in which said operation unit is operative to input an operation instruction for specifying one data transmission means to establish and maintain a line connection with, and specifying positions of specified one or more camera units of said one or more camera units operatively connected with said image inputting unit of specified data transmission means, said receiving control unit is operative to generate an operation request in accordance with said operation instruction inputted by said operation unit, said receiving line connection control unit is operative to receive said operation request

generated by said receiving control unit, to identify said specified data transmission means, to establish and maintain a line connection between said specified data transmission means and one of said data receiving units in accordance with said operation request, and to transmit said operation request through said network to said
5 specified data transmission means, and said transmission control unit is operative to control said image inputting unit in accordance with said line connection state information so that said image inputting unit operates said specified one or more camera units of said one or more camera units to drive one or more driving units of said specified one or more camera units of said one or more camera units to have said
10 camera portions of said specified one or more camera units of said one or more camera units moved horizontally and vertically to said respective specified positions.

49. An image transmitting and receiving method as set forth in claim 47, in which said operation unit is operative to input a switching operation instruction for switching
15 said data transmission means to another data transmission means while said data transmission means maintains a line connection between said data transmission means and one of said data receiving units of said data receiving means, said receiving control unit is operative to generate a switching operation request in accordance with said switching operation instruction inputted by said operation unit, said receiving line
20 connection control unit is operative to receive said switching operation request generated by said receiving control unit, to disconnect a line connection between said data transmission means and the respective one of the data receiving units if required, to identify said another data transmission means, to establish and maintain another line connection between said another data transmission means and another one of said data
25 receiving units in accordance with said switching operation request, and to transmit said operation request through said network to said another data transmission means, said transmission line connection control unit of said another data transmission means is operative to generate said line connection state information in accordance with said switching operation request transmitted by said receiving line connection control unit of
30 said data receiving means, and said transmission control unit is operative to input said line connection state information generated by said transmission line connection control unit, and to control said transmission line connection control unit in accordance with said line connection state information so as to maintain a line connection between said data receiving means and said data transmission means.

50. An image transmitting and receiving method as set forth in claim 49, in which

said preparing step is of further preparing a configuration control unit having a configuration storage portion for inputting configuration conditions to be stored therein, for said data receiving means, said configuration conditions include a time interval for which one data transmission means is switched to another data transmission means, and
5 a switching order in which said data transmission means is switched, and said receiving control unit is operative to generate a regular switching operation request at said time interval in said switching order in accordance with said configuration conditions stored in said configuration control unit, which further comprises a configuration control step of having said configuration control unit input configuration conditions to be stored
10 therein, for said data receiving means.

51. An image transmitting and receiving method as set forth in claim 42, in which said preparing step is of further preparing a configuration control unit having a configuration storage portion for inputting configuration conditions to be stored therein,
15 for said data receiving means, said configuration conditions include information about one-to-one relationship between said one or more data receiving units and said one or more data transmission means, said receiving control unit is operative to generate a receiving operation request in accordance with said configuration conditions stored in said configuration control unit, said receiving line connection control unit is operative to
20 receive said receiving operation request generated by said receiving control unit, to identify said specified one or more data transmission means, to establish and maintain line connections between said specified data transmission means and said one or more data receiving units each corresponding to respective one or more data transmission means in one-to-one relationship in accordance with said receiving operation request,
25 and to transmit said operation request through said network to said specified data transmission means, said transmission line connection control unit of said specified data transmission means is operative to generate said line connection state information in accordance with said receiving operation request transmitted by said receiving line connection control unit of said data receiving means, and said transmission control unit
30 is operative to input said line connection state information generated by said transmission line connection control unit, and to control said transmission line connection control unit in accordance with said line connection state information so as to maintain line connections between said data receiving means and said respective one or more data receiving units, which further comprises a configuration control step of
35 having said configuration control unit input configuration conditions to be stored therein, for said data receiving means.

52. An image transmitting and receiving method as set forth in claim 51, in which said one or more data receiving means are operative to receive said one or more transmission data portions at respective input bit rates, said configuration conditions
5 include information about said input bit rate, said receiving control unit of said data receiving means is operative to generate a receiving operation request in accordance with said configuration conditions stored in said configuration control unit, said receiving line connection control unit is operative to receive said receiving operation request generated by said receiving control unit, to establish and maintain line
10 connections between said specified data transmission means and said data receiving means, and to transmit said receiving operation request through said network to said specified data transmission means, said transmission line connection control unit is operative to generate said line connection state information in accordance with said operation request transmitted by the receiving line connection control unit, and said
15 respective one of said one or more data transmitting units is operative to generate one or more transmission data portions directed to said data receiving means at said input bit rate.

53. An image transmitting and receiving method as set forth in claim 42, in which
20 said data receiving means is operative to receive one or more transmission data portions transmitted by another data transmission means, and said receiving line connection control unit of said data receiving means is operative to establish and maintain another line connection between another one of said data receiving units and said another data transmission means in response to said one or more transmission data portions
25 transmitted by another data transmission means, while said data receiving means maintains a line connection between said data receiving means and one data transmission means, and said receiving line connection control unit maintains a line connection between one of said data receiving units and said data transmission means.

54. An image transmitting and receiving method as set forth in claim 42, in which
30 while said data transmission means maintains a line connection between said data receiving means and said data transmission means, and said transmission line connection control unit maintains a line connection between one of said data transmitting units and said data receiving means so as to transmit said one or more
35 transmission data portions generated by said one of said data transmitting units to said data receiving means, said data transmission means is operative to transmit one or more

transmission data portions to another data receiving means, said transmission line connection control unit of said data transmission means is operative to establish and maintain another line connection between said another data receiving means and another one of said data transmitting units so as to transmit said one or more transmission data portions to said another data receiving means, and said receiving line connection control unit of said another data receiving means is operative to establish and maintain said line connection between one of said data receiving units and said data transmission means to receive said one or more transmission data portions transmitted by said data transmission means.

55. An image transmitting and receiving method as set forth in claim 42, in which when a line connection between data transmission means and data receiving means is disconnected while one of said data transmitting units is transmitting one or more transmission data portions through said network to said data receiving means, said transmission line connection control unit is operative to restore and maintain said line connection between one of said data transmitting units and said data receiving means so as to transmit said one or more transmission data portions generated by said one of said data transmitting units through said network to said data receiving means, said receiving line connection control unit is operative to restore and maintain said line connection between one of said data receiving units and said data transmission means to receive said one or more transmission data portions transmitted by said data transmission means.

56. An image transmitting and receiving method as set forth in claim 42, in which said compressing and encoding unit is operative to compress and encode said moving image signal passed through by said image synthesizing unit when one moving image signal is converted by said image inputting unit and said synthesized moving image signal generated by said image synthesizing unit when more than one moving image signal is converted by said image inputting unit in conformance with the ITU-T Recommendation H.261 standard or ITU-T Recommendation H.263 standard to generate coded moving image signal data, and said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data reconstructed by said one or more data receiving units in conformance with the ITU-T Recommendation H.261 standard or ITU-T Recommendation H.263 standard to reconstruct one or more moving image signals.

57. An image transmitting and receiving method as set forth in claim 42, in which said compressing and encoding unit is operative to compress and encode said moving image signal passed through by said image synthesizing unit when one moving image signal is converted by said image inputting unit and said synthesized moving image signal generated by said image synthesizing unit when more than one moving image signal is converted by said image inputting unit in conformance with the MPEG-1, MPEG-2 or MPEG-3 standard to generate coded moving image signal data, and said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data reconstructed by said one or more data receiving units in conformance with the MPEG-1, MPEG-2, or MPEG-3 standard to reconstruct one or more moving image signals.

58. An image transmitting and receiving method as set forth in claim 42, in which said compressing and encoding unit is operative to compress and encode said moving image signal passed through by said image synthesizing unit when one moving image signal is converted by said image inputting unit and said synthesized moving image signal generated by said image synthesizing unit when more than one moving image signal is converted by said image inputting unit in conformance with the JPEG or JPEG2000 standard to generate coded moving image signal data, and said one or more decompressing and decoding units is operative to decompress and decode said coded moving image signal data reconstructed by said one or more data receiving units in conformance with the JPEG or JPEG2000 standard to reconstruct one or more moving image signals.

59. An image transmitting and receiving method as set forth in claim 43, in which said preparing step is of further preparing a recording unit for temporally storing said coded moving image signal data and coded sound signal data generated by said compressing and encoding unit together with time information indicative of the time at which said coded moving image signal data arrives at said recording unit, event information indicative of the event type of said coded moving image signal data, and number information indicative of the number of said coded moving image signal data so that said coded moving image signal data and coded sound signal data are associated with said time information, said event information and said number information, for said data transmission means, said transmission control unit is operative to control said recording unit in accordance with said line connection state information generated by said transmission line connection control unit with reference to said time information,

said event information, and said number information, which further comprises a recording step of having said recording unit temporally store said coded moving image signal data and coded sound signal data together with time information, event information, and number information so that said coded moving image signal data and coded sound signal data are associated with said time information, said event information and said number information, for said data transmission means.

60. An image transmitting and receiving method as set forth in claim 43, in which said preparing step is of further preparing a recording unit for temporally inputting said coded moving image signal data and said coded sound signal data reconstructed by said one or more data receiving units, and storing said coded moving image signal data and said coded sound signal data in association with time information including a time at which said coded moving image signal data arrives at said recording unit, event information including an event type of said coded moving image signal data, and number information including a number of said coded moving image signal data in accordance with said operation instruction inputted by said operation unit, for said data receiving means, which further comprises a recording step of said recording unit temporally input and store said coded moving image signal data and said coded sound signal data in association with time information, event information, and number information in accordance with said operation instruction inputted by said operation unit, for said data receiving means.

61. An image transmitting and receiving method as set forth in claim 60, in which said operation unit is operative to input a synthesizing operation instruction for synthesizing specified moving image signals or synthesized moving image signals for said image synthesizing unit, said receiving control unit is operative to generate a synthesizing operation request in accordance with said synthesizing operation instruction inputted by said operation unit, and said image synthesizing unit is operative to select specified moving image signals or synthesized moving image signals from among said moving image signals or synthesized moving image signals reconstructed by said one or more decompressing and decoding units in accordance with said synthesizing operation request generated by said receiving control unit and synthesizing said specified moving image signal or synthesized moving image signal to generate a synthesized moving image signal when said moving image signals or synthesized moving image signals are reconstructed by said one or more decompressing and decoding units.

62. An image transmitting and receiving method as set forth in claim 61, in which said operation unit is operative to input a reproducing operation instruction for controlling said recording unit to output said coded moving image signal data and said coded sound signal data stored therein, said receiving control unit is operative to generate a reproducing operation request in accordance with said reproducing operation instruction inputted by said operation unit, said recording unit is operative to output said coded moving image signal data and coded sound signal data stored therein in accordance with said reproducing operation request generated by said receiving control unit, and said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data and said coded sound signal data outputted by said recording unit to reconstruct one or more synthesized moving image signals and sound signals.

63. An image transmitting and receiving method as set forth in claim 62, in which said operation unit is operative to input a searching operation instruction for searching a target coded moving image signal data and coded sound signal data with a key information containing at least one of said time information, said event information and said number information, said receiving control unit is operative to generate a searching operation request in accordance with said searching operation instruction inputted by said operation unit, and said recording unit is operative to search said target coded moving image signal data and coded sound signal data from among said coded moving image signal data and coded sound signal data stored in said recording unit in accordance with said searching operation request including said key information by comparing said time information, said event information, and said number information associated with said coded moving image signal data and coded sound signal data with said key information to identify said target coded moving image signal data and coded sound signal data associated with at least one of said time information, said event information and said number information identical with said at least one of said time information, and to output said target coded moving image signal data and coded sound signal data.

64. An image transmitting and receiving method as set forth in claim 63, in which said preparing step is of further preparing an external appliance unit for outputting a status control signal indicative of the state of said external appliance unit, and an appliance control data communication unit for transmitting said status control signal

outputted by said external appliance unit to said transmission line connection control unit of said data receiving means through said network while said line connection between said data transmission means and said data receiving means is established and maintained, for said data transmission means, and said external appliance control data communication unit is operative to generate and transmit appliance control signal to the external appliance unit in accordance with a line connection state information generated by said transmission line connection control unit, and said external appliance unit is operative to operate in accordance with said respective appliance control signal generated by said appliance control data communication unit, which further comprises an appliance control data communication step of having said appliance control data communication unit transmit said status control signal to said transmission line connection control unit of said data receiving means through said network.

65. An image transmitting and receiving method as set forth in claim 64, in which said data transmission means includes a plurality of external appliance units for respectively outputting a plurality of status control signals each indicative of the state of said external appliance unit, said appliance control data communication unit is operative to transmit said status control signals respectively outputted by said external appliance units to said transmission line connection control unit, and to receive said line connection state information generated by said transmission line connection control unit to generate a plurality of appliance control signals, and said external appliance units being operative to respectively operate in accordance with said appliance control signals generated by said appliance control data communication unit.

66. An image transmitting and receiving method as set forth in claim 65, in which said preparing step is of further preparing an external appliance control unit for inputting an external appliance operation instruction for operating specified one or more external appliance units of said data transmission means to generate an external appliance operation request, for said data receiving means, said receiving line connection control unit is operative to transmit said external appliance operation request generated by said external appliance control unit through said network to said data transmission means when said receiving line connection control unit maintains said line connection between said data receiving means and said data transmission means, said transmission line connection control unit of said data transmission means is operative to receive said external appliance operation request, and to generate a line connection state information in accordance with said external appliance operation request thus received,

and said appliance control data communication unit is operative to receive said line connection state information generated by said transmission line connection control unit to generate one or more appliance control signals, said specified one or more external appliance units are operative to respectively operate in accordance with said one or more appliance control signals generated by said appliance control data communication unit, which further comprises an external appliance control step of having said external appliance control unit input an external appliance operation instruction for operating specified one or more external appliance units of said data transmission means to generate an external appliance operation request, for said data receiving means.

67. An image transmitting and receiving method as set forth in claim 66, in which said external appliance control unit is operative to input an appliance status indicating instruction for displaying the status of specified one or more external appliance units, said one or more external appliance units are operative to respectively output one or more status control signals each indicative of the state of said external appliance unit including the type of said external appliance, said appliance control data communication unit is operative to transmit said one or more status control signals respectively outputted by said one or more external appliance units to said transmission line connection control unit, said transmission line connection control unit is operative to transmit said one or more status control signals through said network to said data receiving means when said transmission line connection control unit maintains said line connection between data transmission means and said data receiving means, said receiving line connection control unit of said data receiving means is operative to receive said one or more status control signals, and said external appliance control unit is operative to input said one or more status control signals received by said receiving line connection control unit, and to indicate the status of said specified one or more external appliance units in accordance with said appliance status indicating instruction for displaying the status of specified one or more external appliance units.

68. An image transmitting and receiving method as set forth in claim 67, in which said external appliance control unit is operated to input an appliance status displaying instruction for displaying the status of specified one or more external appliance units and output said appliance status displaying instruction to said monitoring unit, and said monitoring unit is operative to input said one or more status control signals respectively indicative of the status of said one or more external appliance units received by said receiving line connection control unit, and to display the status of said specified one or

more external appliance units from among said one or more external appliance units in accordance with said appliance status displaying instruction outputted by said external appliance control unit when said receiving line connection control unit maintains said line connection between said data receiving means and said data transmission means.

5

69. An image transmitting and receiving method as set forth in claim 68, in which said external appliance control unit is operative to input an external appliance operation instruction for operating specified one or more external appliance units when said monitoring unit displays the status of said specified one or more external appliance units while said receiving line connection control unit maintains said line connection between said data receiving means and said data transmission means.

10

70. An image transmitting and receiving method as set forth in claim 69, in which said monitoring unit is operative to display said one or more moving pictures and the status of said specified one or more external appliance units on said screen at the same time.

15

71. An image transmitting and receiving method as set forth in claim 70, in which said external appliance control unit is operative to input an external appliance operation instruction for operating specified one or more external appliance units when said monitoring unit displays said one or more moving pictures and the status of said specified one or more external appliance units while said receiving line connection control unit maintains said line connection between said data receiving means and said data transmission means.

20

25

72. An image transmitting and receiving method as set forth in claim 70, in which said image inputting unit of said data transmission means is operative to generate camera status information indicative of the status of said camera unit, said operation unit is operative to input a camera status display instruction for displaying the status of specified camera unit of specified data transmission means, said receiving control unit is operative to generate a camera status display operation request in accordance with said camera status display instruction inputted by said operation unit, said receiving line connection control unit is operative to transmit said camera status display operation request generated by said receiving control unit to said specified data transmission means while said receiving line connection control unit maintains said line connection between said data receiving means and said specified data transmission means, said

30

35

transmission line connection unit is operative to receive said camera status display operation request to be outputted to said image inputting unit of said specified camera unit, said image inputting unit is operative to generate said camera status information indicative of the status of said specified camera unit from said camera units in accordance with said camera status display operation request outputted by said transmission line connection unit, and said transmission line connection unit is operative to transmit said camera status information to said receiving line connection control unit, and said monitoring unit is operative to display said status of said specified camera unit of said specified data transmission means in accordance with said camera status information.

73. An image transmitting and receiving method as set forth in claim 72, in which said camera unit further includes a rotatable plate on which said camera portion is mounted, said rotatable plate is electrically connected with said image inputting unit, said transmission control unit is operative to control said image inputting unit so as to rotate said camera portion to any one of a plurality of camera angles of camera units in association with respective camera unit position numbers, said image inputting unit includes a storage portion for storing said camera angles of a specified camera unit and camera unit position numbers, the status of said camera unit includes all of camera angles of camera units and said camera unit position numbers, whereby said operation unit is operative to input a camera unit position number of a specified data transmission means and a camera angle number storing instruction for storing said camera angle of said specified camera unit so as to store the present camera angle of said specified camera unit of said specified data transmission means in association with said camera unit position number thus inputted, said receiving control unit is operative to generate a camera angle number storing operation request in accordance with said camera angle number storing instruction inputted by said operation unit, said receiving line connection control unit is operative to transmit said camera angle number storing operation request generated by said receiving control unit to said specified data transmission means while said receiving line connection control unit maintains said line connection between said data receiving means and said specified data transmission means, said transmission line connection unit is operative to receive said camera angle number storing operation request to be outputted to said image inputting unit of said specified camera unit, and said image inputting unit is operative to store the present camera angle of said specified data transmission means in association with said camera unit position number thus inputted in accordance with said camera angle number storing

operation request outputted by said transmission line connection unit.

74. An image transmitting and receiving method as set forth in claim 73, in which said operation unit is operative to input a camera unit position number of a specified data transmission means and a camera angle number operation instruction for moving said camera angle of said specified data transmission means to said camera angle in association with said camera unit position number thus inputted, said receiving control unit is operative to generate a camera angle number operation request in accordance with said camera angle number operation instruction inputted by said operation unit, and said transmission control unit is operative to control said image inputting unit so as to rotate said camera portion of said specified camera unit to said camera angle in association with said camera unit position number inputted by said operation unit.

75. An image transmitting method of transmitting one or more transmission data portions each generated as a result of compressing and encoding one or more moving image signals taken by respective camera units, comprising the steps of:

a preparing step of preparing:

a plurality of camera units each for taking a moving picture of an object;

an image inputting unit operatively connected with said camera units for operating one or more said camera units to input one or more moving pictures taken by said one or more camera units to be converted to one or more moving image signals;

an image synthesizing unit for passing through said moving image signal when one moving image signal is converted by said image inputting unit and synthesizing more than one moving image signal to generate a synthesized moving image signal when more than one moving image signal is converted by said image inputting unit;

a compressing and encoding unit for compressing and encoding said moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through one moving image signal and compressing and encoding said synthesized moving image signal generated by said image synthesizing unit when said image synthesizing unit synthesizes more than one moving image signal to generate coded moving image signal data;

one or more data transmitting units for inputting said coded moving

image signal data generated by said compressing and encoding unit, generating address information about one or more image receiving apparatus to which said coded moving image signal data is directed, and attaching address information about said one or more image receiving apparatus to said coded moving image signal data to generate one or more transmission data portions directed to said respective one or more image receiving apparatus;

a transmission line connection control unit for inputting said one or more transmission data portions generated by said one or more data transmitting units, establishing and maintaining one or more line connections between said one or more data transmitting units and respective one or more image receiving apparatus in accordance with said address information attached in said one or more transmission data portions so as to transmit said one or more transmission data portions through said network to said respective one or more image receiving apparatus, and generating line connection state information; and

a transmission control unit for controlling said image inputting unit, said image synthesizing unit, and said transmission line connection control unit in accordance with said line connection state information generated by said transmission line connection control unit;

a transmission control step of having said transmission control unit control said image inputting unit, said image synthesizing unit, and said transmission line connection control unit in accordance with said line connection state information generated by said transmission line connection control unit.

76. An image receiving method for receiving said one or more transmission data portions transmitted by one or more image transmission apparatus through a network comprising the steps of:

a preparing step of preparing:

a receiving line connection control unit for receiving said one or more transmission data portions transmitted by said respective one or more image transmission apparatus;

one or more data receiving units for receiving said one or more transmission data portions to reconstruct coded moving image signal data, said receiving line connection control unit operative to establish and maintain one or more line connections between said one or more data receiving units and said respective one or more image transmission apparatus in accordance with

said address information attached in said one or more transmission data portions so as to receive said one or more transmission data portions through said network from said respective one or more image transmission apparatus;

one or more decompressing and decoding units electrically connected with said respective one or more data receiving units in one-to-one relationship for decompressing and decoding said coded moving image signal data reconstructed by said respective one or more data receiving units to reconstruct one or more moving image signals or synthesized moving image signals;

an image synthesizing unit for passing through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing and decoding units and synthesizing more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and decoding units;

a data outputting unit for outputting said moving image signal or said synthesized moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal or said synthesized moving image signal, and outputting said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit generates said synthesized moving image signal;

a monitoring unit having a screen for displaying one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and displaying a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit;

an operation unit for inputting an operation instruction therethrough; and

a receiving control unit for generating an operation request in accordance with said operation instruction inputted by said operation unit, controlling said receiving line connection control unit in accordance with said operation request and said one or more transmission data portions transmitted by said respective one or more image transmission apparatus,

a receiving control step of having said receiving control unit generate an operation request in accordance with said operation instruction inputted by said

operation unit, controlling said receiving line connection control unit in accordance with said operation request and said one or more transmission data portions transmitted by said respective one or more image transmission apparatus.

5 77. An image transmitting method as set forth in claim 75, in which said preparing step is of further preparing a sound collecting unit for collecting sounds to be converted into sound signals; and a sound inputting unit for inputting said sound signals converted by said sound collecting unit; said compressing and encoding unit is operative to compress and encode said synthesized moving image signal synthesized by said image
10 synthesizing unit and said sound signals inputted by said sound inputting unit to generate coded moving image signal data and coded sound signal data; said one or more data transmitting units are operative to input said coded moving image signal data and said coded sound data generated by said compressing and encoding unit, to generate address information about said one or more image receiving apparatus to which said
15 coded moving image signal data and said coded sound signal data are directed, and to attach said address information about said one or more image receiving apparatus to said coded moving image signal data and said coded sound data to generate one or more transmission data portions directed to said respective one or more image receiving apparatus, and which further comprises a sound inputting step of having said sound
20 inputting unit input said sound signals converted by said sound collecting unit.

78. An image receiving method as set forth in claim 76 in which
said one or more data receiving units are operative to receive said one or more
25 transmission data portions to reconstruct said coded moving image signal data and said coded sound signal data;

said one or more decompressing and decoding units are operative to decompress and decode said coded moving image signal data and said coded sound signal data reconstructed by said one or more data receiving units to reconstruct one or more synthesized moving image signals and sound signals;

30 said image synthesizing unit is operative to pass through said moving image signal or said synthesized moving image signal when one moving image signal or one synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to synthesize more than one moving image signal or synthesized moving image signal to generate a synthesized moving image signal when
35 more than one moving image signal or synthesized moving image signal is reconstructed by said one or more decompressing and decoding units, and to pass

through said sound signals decompressed and decoded by said one or more decompressing and decoding units

said data outputting unit is operative to output said moving image signal passed through by said image synthesizing unit when said image synthesizing unit passes through said moving image signal, and to output said synthesized moving image signal synthesized by said image synthesizing unit when said image synthesizing unit generates said synthesized moving image signal, and to output said sound signals passed through by said image synthesizing unit; and

said monitoring unit is further provided with a speaker and operative to display one moving picture on said screen when said moving image signal is outputted by said data outputting unit, and to display a plurality of moving pictures on said screen when said synthesized moving image signal is outputted by said data outputting unit, and to audibly output said sound signals outputted by said data outputting unit.

79. An image transmission method as set forth in claim 75, in which said respective one of said one or more data transmitting units is operative to generate one or more transmission data portions directed to image receiving apparatus at an input bit rate at which image receiving apparatus can receive said one or more data portions.

80. Image transmission method as set forth in claim 75 in which said preparing step is of further preparing a recording unit for temporally storing said coded moving image signal data and coded sound signal data generated by said compressing and encoding unit together with time information indicative of the time at which said coded moving image signal data arrives at said recording unit, event information indicative of the event type of said coded moving image signal data, and number information indicative of the number of said coded moving image signal data so that said coded moving image signal data and coded sound signal data are associated with said time information, said event information and said number information, said transmission control unit is operative to control said recording unit in accordance with said line connection state information generated by said transmission line connection control unit with reference to said time information, said event information, and said number information, and which further comprises a recording step of having said recording unit temporally storing said coded moving image signal data and coded sound signal data together with time information, event information, and number information so that said coded moving image signal data and coded sound signal data are associated with said time information, said event information and said number information.

81. An image receiving method as set forth in claim 76 in which said preparing step is of further preparing a recording unit for temporally inputting said coded moving image signal data and said coded sound signal data reconstructed by said one or more data receiving units, and storing said coded moving image signal data and said coded sound signal data in association with time information including a time at which said coded moving image signal data arrives at said recording unit, event information including an event type of said coded moving image signal data, and number information including a number of said coded moving image signal data in accordance with said operation instruction inputted by said operation unit and which further comprises a recording step of having said recording unit temporally inputting and storing said coded moving image signal data and said coded sound signal data in association with time information, event information, and number information in accordance with said operation instruction inputted by said operation unit.

82. An image receiving method as set forth in claim 81, in which said recording unit is operative to search said target coded moving image signal data and coded sound signal data from among said coded moving image signal data and coded sound signal data stored in said recording unit in accordance with said searching operation request including said key information by comparing said time information, said event information, and said number information associated with said coded moving image signal data and coded sound signal data with said key information to identify said target coded moving image signal data and coded sound signal data associated with at least one of said time information, said event information and said number information identical with said at least one of said time information, and to output said target coded moving image signal data and coded sound signal data.